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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/765,437	01/22/2001	Toshiya Suzuki	001764	9007
38834	7590	03/17/2004	EXAMINER	
WESTERMAN, HATTORI, DANIELS & ADRIAN, LLP 1250 CONNECTICUT AVENUE, NW SUITE 700 WASHINGTON, DC 20036			GUERRERO, MARIA F	
			ART UNIT	PAPER NUMBER
			2822	

DATE MAILED: 03/17/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

# Office Action Summary

Application No.

09/765,437

Applicant(s)

SUZUKI, TOSHIYA

Examiner

Maria Guerrero

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*su*

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

## Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

## Status

- 1) ☒ Responsive to communication(s) filed on 08 December 2003.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

## Disposition of Claims

- 4) ☒ Claim(s) 1-3,5-16 and 18-28 is/are pending in the application.
- 4a) Of the above claim(s) 1-3,5-14 and 21-24 is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 15,16,18-20 and 25-28 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

## Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

## Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some \* c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \* See the attached detailed Office action for a list of the certified copies not received.

## Attachment(s)

- 1) ☐ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)  
Paper No(s)/Mail Date \_\_\_\_\_
- 4) ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date. \_\_\_\_\_
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: \_\_\_\_\_

### DETAILED ACTION

1. This Office Action is in response to the Amendment filed August 8, 2003 and the Election filed December 8, 2003.

Claim 4 and 17 are canceled.

Claims 1-3, 5-16, and 18-28 are pending.

#### ***Election/Restrictions***

2. Claims 7, 14, and 21 are withdrawn from further consideration pursuant to 37 CFR 1.142(b) as being drawn to a nonelected invention, there being no allowable generic or linking claim. Election was made **without** traverse in Paper No. 6.

Applicant's election of Species III (claims 15-20 and 25-28) in Paper No. 17 is acknowledged. Because applicant did not distinctly and specifically point out the supposed errors in the restriction requirement, the election has been treated as an election without traverse (MPEP § 818.03(a)).

Claims 1-3, 5-6, 8-13, and 22-24 are withdrawn from further consideration pursuant to 37 CFR 1.142(b) as being drawn to a nonelected invention, there being no allowable generic or linking claim. Election was made **without** traverse in Paper No. 7.

#### ***Claim Objections***

3. Claims 15 and 25 are objected to because of the following informalities: the term "patterning" is misspelled on line 7 of each claim. Appropriate correction is required.

***Claim Rejections - 35 USC § 112***

The following is a quotation of the first paragraph of 35 U.S.C. 112:

The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

4. Claim 28 is rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the written description requirement. The claim(s) contains subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention. The specification does not provide support for the limitation "forms the metal nitride layer using hydrogen-containing atmosphere". However, the specification recites forming the metal nitride layer without using hydrogen-containing atmosphere (page 14, lines 23-26).

***Claim Rejections - 35 USC § 102***

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

5. Claims 15-16 are rejected under 35 U.S.C. 102(e) as being anticipated by Lee (U.S. 6,077,450).

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Lee teaches forming a rare metal layer above a semiconductor substrate formed with semiconductor elements, forming an insulating mask layer (silicon oxide) on the rare metal layer, patterning the rare metal layer by using the patterned insulating mask layer (col. 3, lines 10-15, 20-28). Lee teaches forming a metal nitride layer on the rare metal layer (Fig. 3a, col. 3, lines 5-12). Lee teaches terminated patterning the insulating mask before the rare metal layer is exposed and patterning the metal nitride and the rare metal layer by using the patterned insulating mask layer (the resist pattern is removed before patterning the metal nitride layer) (Fig. 3b-3d, col. 3, lines 10-35).

### ***Claim Rejections - 35 USC § 103***

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

6. Claims 18-20 and 26 are rejected under 35 U.S.C. 103(a) as being unpatentable over Lee (U.S. 6,077,450) in view of Joo (U.S. 6,342,425).

Regarding claim 18, Lee does not specifically show using hydrogen-containing gas to form the metal nitride layer.

Regarding claims 19-20 and 26, Lee does not specifically show forming a dielectric film on the patterned lower electrode, forming a silicon oxide film by TEOS based CVD, and annealing the semiconductor substrate in hydrogen-containing gas. However, Joo discloses forming a dielectric film on the patterned lower electrode (Fig.

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3D, col. 4, lines 20-25). Joo teaches forming a silicon oxide film by TEOS based CVD, and annealing the semiconductor substrate in hydrogen-containing gas (the thermal process inherently discloses this step) (col. 4, lines 60-67, col. 5, lines 1-5).

Therefore, it would have been obvious to a person of ordinary skill in the art at the time of the invention to modify Lee's process by including the information provided by Joo. The modification would provide a process for forming a capacitor without damaging the structure during patterning.

7. Claim 25 and 27 are rejected under 35 U.S.C. 103(a) as being unpatentable over Lee (U.S. 6,077,450) in view of Joo (U.S. 6,342,425) and Hasegawa et al. (U.S. 6,452,274).

Lee teaches forming a rare metal layer above a semiconductor substrate formed with semiconductor elements, forming an insulating mask layer (silicon oxide) on the rare metal layer, patterning the rare metal layer by using the patterned insulating mask layer (col. 3, lines 10-15, 20-28). Lee teaches forming a metal nitride layer on the rare metal layer (Fig. 3a, col. 3, lines 5-12). Lee teaches terminated patterning the insulating mask before the rare metal layer is exposed and patterning the metal nitride and the rare metal layer by using the patterned insulating mask layer (the resist pattern is removed before patterning the metal nitride layer) (Fig. 3b-3d, col. 3, lines 10-35).

Regarding claim 25, Lee does not specifically show forming a dielectric film over the semiconductor substrate, the insulating mask being a TaO layer. However, Joo discloses forming a dielectric film over the semiconductor substrate (Fig. 3D, col. 4,

lines 20-25). Hasegawa et al. shows TaO being used instead of silicon oxide as a mask as conventional in the art (col. 21, lines 1-8).

Therefore, it would have been obvious to a person of ordinary skill in the art at the time of the invention to modify the combination of Lee reference by including the information provided by Joo and Hasegawa et al. The modification would provide a process for forming a capacitor without damaging the structure during patterning and having an increased etch selectivity.

### ***Response to Arguments***

8. Applicant's arguments filed August 8, 2003 have been fully considered but they are not persuasive. Claims 15-16, 18-20, 25-27 stand rejected.

Applicant argued that Lee does not teach or suggest the step of: terminating patterning the insulating mask layer by using a resist pattern before the rare metal layer is exposed; the resist pattern being removed before the patterning the metal nitride layer and the rare metal layer using the patterned insulating mask. However, Lee teaches terminated patterning the insulating mask before the rare metal layer is exposed and patterning the metal nitride and the rare metal layer by using the patterned insulating mask layer (the resist pattern is removed before patterning the metal nitride layer because only the patterned insulating mask layer is employed as a mask) (Fig. 3b-3d, col. 3, lines 10-35).

Furthermore, the elements must be arranged as required by the claim, but this is not an ipsissimis verbis test, i.e., identity of terminology is not required. *In re Bond*, 910 F.2d 831, 15 USPQ2d 1566 (Fed. Cir. 1990).

In response to applicant's argument that the references fail to show certain features of applicant's invention, it is noted that the features upon which applicant relies (i.e., the patterned mask layer is used in the semiconductor device) are not recited in the rejected claim(s). Although the claims are interpreted in light of the specification, limitations from the specification are not read into the claims. See *In re Van Geuns*, 988 F.2d 1181, 26 USPQ2d 1057 (Fed. Cir. 1993).

In response to applicant's arguments against the references individually, one cannot show nonobviousness by attacking references individually where the rejections are based on combinations of references. See *In re Keller*, 642 F.2d 413, 208 USPQ 871 (CCPA 1981); *In re Merck & Co.*, 800 F.2d 1091, 231 USPQ 375 (Fed. Cir. 1986).

Applicant's arguments with respect to claim 28 have been considered but are moot in view of the new ground(s) of rejection.

### ***Conclusion***

9. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. Shen et al. (U.S. 6,420,272) (of record) and Nam et al. (U.S. 6,054,391) (of record) teach silicon oxide, silicon nitride, titanium, titanium oxide, and titanium nitride are typical mask materials used for patterning platinum.



10. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).


A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not mailed until after the end of the **THREE-MONTH** shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than **SIX MONTHS** from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Maria Guerrero whose telephone number is 571-272-1837.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Amir Zarabian can be reached on 571-272-1852. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

  
Maria Guerrero  
Primary Examiner  
March 8, 2004